

5 WHAT IS CLAIMED IS:

1 1. Paper having wet strength, temporary wet strength and dry strength properties comprising aldehyde modified cellulose pulp wherein the cellulose pulp has from about 1 to 20 mmoles of aldehyde per 100 g of cellulose.

10 2. ~~The paper of claim 1 wherein the cellulose pulp has from about 5 to 20 mmoles of aldehyde per 100 g of cellulose.~~

15 3. The paper of Claim 2 which has a wet strength to dry strength ratio of at least 20%.

4. The paper of Claim 3 wherein the paper has an improved compression strength and resistance of greater than about 1% over that of a paper prepared from a corresponding unmodified cellulose pulp.

5. The paper of Claim 4 wherein the paper has an improved compression strength and resistance of greater than about 5%.

20 6. The paper of claim 4 wherein the improved compression strength and resistance is measured under conditions of high humidity.

4 7. ~~The paper of Claim 2 wherein the cellulose pulp has a ratio of aldehyde to carboxylic acid functionality of about 0.2 or more.~~

5 8. The paper of Claim 7 which has a wet strength to dry strength ratio of at least 20%.

25 9. In the method of making paper having wet strength, temporary wet strength and dry strength properties, the improvement comprising using the aldehyde modified cellulosic material of Claim 1 as a pulp stock or a component of the pulp stock.

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~~10. The method of Claim 9 wherein the prepared paper has a wet strength/dry strength ratio of at least 20% or more.~~

11. The method of claim 10 wherein the prepared paper has an improvement in compression strength and resistance of greater than about 1% over paper prepared from a corresponding unmodified cellulose pulp under standard environment conditions.

~~12. The method of claim 11 wherein the prepared paper has an improvement in compression strength and resistance of greater than about 5%.~~

13. The method of Claim 11 wherein the compression strength and resistance is measured under conditions of high humidity.

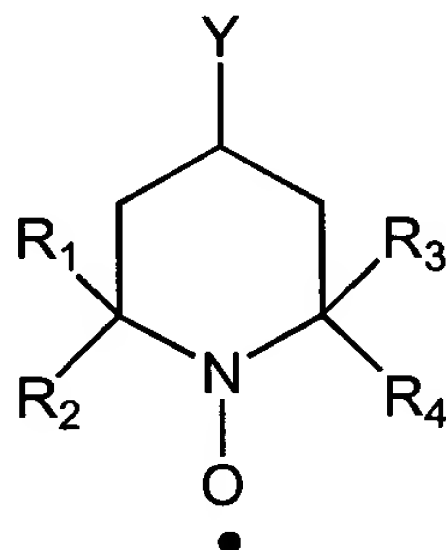
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~~14. The method of Claim 9 wherein the oxidant has an equivalent oxidizing power of from about 0.05 to 5.0 g of active chlorine per 100 g of cellulose.~~

15. The method of Claim 14 wherein the oxidant is sodium hypochlorite or sodium hypobromite.

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16. The method of Claim 15 wherein the nitroxyl radical has the formula:



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where Y is H, OH or NH-C(=O)-CH<sub>3</sub>.

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17. The method of Claim 16 wherein the prepared paper has a wet strength/dry strength ratio of at least 20%.

~~18. The method of Claim 16 wherein the aldehyde content of the~~  
10 cellulose is from about 5 to 20 mmole/100 g of cellulose.

19. The method of Claim 18 wherein the oxidant is sodium hypobromite formed in situ by the addition of sodium hypochlorite and sodium bromide.

20. The method of Claim 19 wherein the cellulose material has a ratio of aldehyde to generated carboxylic acid functionality of greater than or equal to 0.5 based on mmole/ 100 g of cellulose.

21. The method of Claim 19 wherein from about 0.1 to 10% by weight of sodium hypochlorite based on the weight of cellulose and from about 0.1 to 5% by weight of sodium bromide based on the weight of cellulose are used.

22. The method of Claim 21 wherein the prepared paper has a wet strength/dry strength ratio of at least 20%.

~~23. Paper produced by the method of Claim 9.~~

24. Paper produced by the method of Claim 21.

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25. Paper produced by the method of Claim 16.

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